J SERIES

ECONO KILNS

OPERATING MANUAL

L&L MANUFACTURING CO.

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CHESTER, PENNSYLVANIA 19016

You are now the proud owner of an L & L Econo-Kiln, engineered to give you the utmost in performance and results.

CHECKING SHIPMENT: Your kiln was carefully packed and inspected prior to shipment, to make sure that your kiln and accessories were in perfect condition.

When carrier makes delivery, you should immediately unpack the kiln and accessories to ascertain whether or not any damage had occurred in transit.

If damage did occur, retain all of the packaging material, and notify the delivering carrier at once, requesting an inspection report. Retain all papers so that you can file a proper claim. We will assist you in any way possible with your claim.

GUARANTEE: Be sure to read and fill out the guarantee form that is given with each kiln. Return the lower portion to our company, so that it will be on file.

ASSEMBLY OF KILN:

A. Place steel stand at your kiln location.
B. Place the floor section of the kiln on the steel stand, making certain it is centered properly.
C. Place the body sections of the kiln on top of each other, including the extension (if ordered).
D. Then simply plug each section into the special receptacle on the instrument panel, make certain that numbers of zone match with number on receptacle.
E. Vacuum the kiln before using it. (With power disconnected from kiln)
F. Do not place the kiln closer than one foot to any wall.

POWER SUPPLY: From the wiring diagram, have your electrician install the proper receptacle and safety switch at your kiln location. Have receptacle placed in such a manner so that plug in cord can in no way touch the body of the kiln. Some models hook-up permanantly to power supply.

Be sure that your fuse ampere capacity is enough to carry the electrical load required. Be sure that your power lines are also heavy enough to carry the required electrical load.

It is a good idea to have your electrical installation with enough ampere capacity requirements to carry the load of a kiln extension, which you may desire to buy in the future.

PYROMETER OR PYROMETER SYSTEM: Each section of the kiln has a hole in the Stainless Steel already punched out, so that the installation of the thermocouple or thermocouples of a pyrometer or pyrometer system may easily be installed by you.

The pyrometer comes with one thermocouple; a pyrometer system comes with a thermocouple for each section of the kiln.

If either one is ordered with the kiln, the thermocouple hole or holes is drilled through the fire-brick section at our plant.

If these items are ordered at a later date, you will only have to drill the thermocouple holes through the fire-brick.

The pyrometer or pyrometer system is made so that it can be attached to the kiln or hung on a wall; we recommend that it be hung on a wall.

After the installation of the thermocouples, in the case of the pyrometer system, place a match at each thermocouple, turn the switch to that particular thermocouple to see that it reads up-scale. Repeat for each thermocouple.

If, at any thermocouple, the needle reads down-scale, reverse that particular thermocouple wire.

SWITCHES: Each section of the kiln has an input control switch provided on the instrument panel.

This type of switch will give you infinite control over the rate of speed of the firing.

You can fire as slowly as you desire, or as fast as the kiln can take to reach a desired temperature.

Since this switch controls the amount of electrical current coming into the kiln, you can also maintain a desired temperature manually. (This would require a pyrometer or pyrometer system, as you must be able to know what degree or temperature the kiln is at). At the desired temperature, you simply turn the switch knob until the needle on the pyrometer is stationary.

This way you are balancing out the heat input against the heat loss.

The use of the terms Low means a 22½% on time setting, Medium a 50% on time setting and High a 100% on time setting on the Infinite control switch.

PILOT LIGHTS: There is a pilot light for each switch.

"Yes", the little red lights on the kiln control panel will flicker on and off at all switch settings except on high. This is a normal operating characteristic of the switch and actually shows that it is functioning properly.

The switch and light operate just like the oven control on the average electric range. The switches are designed to maintain the temperature that you desire. When heat is required, the switch is on; when not required, it is off. The light simply shows when the switch is on or off.

When your firing schedule calls for the switches to be set on "high" then the switch will always be "on" and the light always "on". When the ware reaches maturity and the kiln sitter turns the kiln off, then, of course, both switches and lights will be "off".

The little red lights are warning lights to guard against over-firing the kiln. At a glance you can check whether the kiln is on or off. If they are still on beyond the expected firing time, then check the kiln carefully.

KILN-SITTER: Read your Dawson Kiln-Sitter book carefully. Make sure that the kiln-sitter is working properly before any firings. With your kiln, you have two (2) 020 cones.

In testing, you will use high heat only. When you are ready to test the kiln-sitter, turn all of the switches to the highest point. The cone should go over within an hour, making the sitter cut off the kiln, but up to 2 hours may be needed if you have a low voltage condition.

If, at the end of 2 hours, the kiln-sitter has not turned the kiln off, turn it off manually, as it probably needs an adjustment. Check the Dawson Kiln-Sitter book on how to make this adjustment.

PYROMETER OR PYROMETER SYSTEMS: ADJUSTMENT OF KILN ZONE ACCURACY

Temperature accuracy in all kilns is subject to loading conditions, etc. The L & L Econo-Kilns are equipped with infinite control switches, so that control over heating rate and zone accuracy are easily controllable. Best zone accuracy requires a pyrometer system. This is the only way in which one may be able to determine the temperature at all points in your kiln at any time during the firing. If you wish to insure accurate firing in all zones, we recommend the use of the pyrometer system, which may be installed at any time. The pyrometer system with its multi-thermocouple system will indicate the kiln temperature at the various levels as you fire your kiln. At about 1,000°F. start taking readings on your pyrometer system, and if necessary, adjust your zone switches to even out the firing chamber temperatures. If this is done properly, you will obtain even temperatures throughout the firing chamber when you reach maturity.

The pyrometer system will enable you to determine the temperatures in all zones, and indicate the necessary adjustments to the settings of your infinite zone switches to insure even temperatures in all zones while the kiln is heating up. This will insure accurate temperatures throughout the kiln at the end of the firing.

SOAKING: Sometimes it may be desirable to "soak" at your end temperature for unusual glaze effects. This may be best accomplished by using a pyrometer system to make certain that you do not exceed your temperature. When the kiln reaches the desired temperature you may manipulate your switches to "hold" the desired temperature while observing your pyrometer readings.

COOLING: If your kiln is cooling too rapidly for good glaze results, or if the cooling is so rapid that cracking occurs on certain large pieces, it is recommended to cool under power. This is accomplished by turning your switches to "low heat" for the initial cooling period. This setting is 22½% of the power of the infinite control switch. Sometimes, turning to "medium heat" or 50% setting, may be all right at first, before going to the "low" setting. Here again, the pyrometer system affords accurate and repeatable control over this important phase of your firing cycle.

You can check out the pyrometer against the cones; remember the most accurate reading are the cones.

If your pyrometer is inaccurate, do not make any adjustments, as the inaccuracy does not vary.

When a cone goes over, simply note where the needle of the pyrometer is reading, draw a line at that point on the glass and mark the cone equivalent. From that point on, you are reading accurately with the cone.

KILN-WASH: Kiln wash the floor of the kiln and the upper sides of the shelves only.

Apply the kiln-wash to the thickness of a postcard or 1/16th of an inch.

The only purpose of kiln-wash is to prevent any glaze that drips from a piece from sticking to the floor or shelves. This saves both the piece and the floor or shelves.

If dripping should occur, simply remove dripping and cover the spot with new kiln-wash. Kiln wash is a powder mixed with water to a light creamy consistency.

LOADING OF THE KILN WITH GREENWARE: When placing greenware in kiln, all pieces may touch each other.

Always place lids on the pieces they go with when firing to bisque; this will prevent possible distortion.

It is important to place the tallest pieces on the center of the shelf and work outward to the shortest pieces. This will give you complete heat circulation.

Always use low, or a 22½% setting on the switch, and medium heat, or a 50% setting, for one hour each, then high heat or 100% setting to maturity.

The low heat can be used a great deal longer if desired, as its only purpose is to thoroughly dry the ware and to start the expansion of the ware to take place, so that the higher heats will not affect the ware.

By using low heat, then medium heat, and finally high heat you will never crack, break or distort any of the ware.

Put peephole plugs into peepholes after the low firing is over.

LOADING THE KILN WITH GLAZE-WARE: When placing ware into the kiln to be fired, we suggest that the pieces should be placed ½" apart, so that when they are heated and expand (which all pieces do when being fired) there is no danger of them touching each other. If pieces are placed too close together, they may touch and stick to each other, thereby ruining both pieces of ware.

Except for placing the ware the proper distance from each other, and stilting the ware for heat circulation, follow the instructions for the firing of greenware.

It is still important to go through low, medium and high heats, to get perfect results.

Be certain, when placing ware in the kiln, that no piece in expanding, can touch the rod of the kiln-sitter, as this would prevent the kiln-sitter from turning off the kiln even though the cone bends properly.

OVERGLAZE FIRING: When firing overglazes such as Gold, Palladium, Mother of Pearl, China Paints etc., the kiln must be vented during the firing up to 1,100°F. before the lid is closed.

Leave the peepholes open during the venting period, and prop the lid open about 2 inches.

Turn all the switches on low for ½ hour, medium for ½ hour, and then high to maturity. (This is to prevent a sudden thermal shock to your ware.)

Since the temperature to which you are firing is not considered a really high temperature, some ceramists like to fire these items with venting throughout the complete firing.

DANGER OF FORCE COOLING THE KILN: To get the best results from your firing, the kiln should not be opened until it is completely cooled off, as the speed of cooling your kiln affects the final results of your glaze firing.

Often people are impatient and force cool the kiln by propping up the lid when the temperature is 500°F. or a little less. Not only do you not get the best glaze results, but you subject the lid brick to great thermal shock, which makes the facing material on the lid flake off, possibly cracking the fire-brick.

If you placed a glass in your freezer for a few hours, then removed it and dropped it into boiling water, would you be shocked if the glass broke? The same is true for your kiln.

TROUBLE SHOOTING: If your kiln does not heat properly, check as follows:

If you have frequent fuse blowing, and this occurs after the kiln is on for a period of time, but not immediately, it may be due to a defective fuse box. If the fuse box heats up considerably, it heats the fuse to a point where it cannot carry its rated current. Replace fuse box. Check all connections for overheating. Replace any defective cord or receptacles.

If your fuses blow immediately, check for short circuits.

Check the element for breaks in the holder and especially where it penetrates the firebrick to the connection panel. Move the element gently, as it is brittle. Make sure power is off when checking, to avoid danger of electrical shock.

If your elements are not defective, then the switch, receptacle or small plug-in cord may be defective. Replace defective parts. If in doubt, replace your switch first.

POOR VOLTAGE: If your kiln takes an unusually long time to fire, it is possible that you may have poor voltage. First, check your receptacle for poor connections. If the receptacle on plug-in types heats up and is very hot to the touch, replace with a heavier duty receptacle. Sometimes running a heavier line will correct the trouble. In some cases it is possible for your electric company to correct the trouble. Ask them to run a recorded volt test with the kiln running and also with the kiln not running. Ask for the results of the test, and if the average voltage is less than that rated voltage on the kiln, an extended firing time may be expected. This test should be run over a 24 hour period to give you an exact picture of your voltage.

If element does not heat, follow this procedure:

In plug-in types, check to see that plug is in receptacle properly.
Check fuses. Put in new ones, just to be sure.
Check switch box for oxidation of contacts.
Check elements by testing with a test lamp or some similar method.
If element fuses are okay, then the trouble is with the switch. When ordering the switch, be certain to give the model number of the kiln.

FIRE-BRICK & ELEMENT HOLDER REPLACEMENT:

In the firing chamber of the Econo-Kiln you can replace each individual piece of fire-brick and element holders very easily.

The fire-bricks in the Econo-Kiln firing chambers are not cemented together; they are cut in such a way as to be held in position by the pressure of the stainless steel band.

Unscrew switch box and push to side.

Loosen the 2 screw devices which loosens the stainless steel band. This releases the fire-brick for removal. Simply let the element hang out of the element holder. Remove ruined piece of fire-brick or holder, and place new piece of fire-brick or holder in place. Then simply reverse the procedure.

We have eliminated what is usually a major kiln repair job to the lowest possible cost, plus making it so that anyone can do the repairs.

MISCELLANEOUS: Each Econo-Kiln is made so that if, for any reason, you ruin the floor of the kiln, you are not put to the expense of purchasing a new floor.

Simply turn the floor over.

Our company cannot assume any responsibility for a Kiln-Sitter. This item is purchased by us. We install it and supply you with the material to test it, prior to doing your regular firings. (All kiln manufacturers purchase the kiln-sitter).

We can only be responsible for defects in the kiln itself.

Our company purchases the shelves used in the kilns, and again, cannot assume any responsibility for defects or imperfections.

PLEASE REMEMBER THAT ALL KILNS SHOULD BE PLACED IN A WELL VENTILATED AREA. THE AREA MUST BE COVERED FOR PROTECTION FROM THE ELEMENTS.

BEAR IN MIND THAT THE SURFACE OF ANY KILN IS HOT.

CAUTION SHOULD BE TAKEN THAT NO ONE EXCEPT THE EXPERIENCED OPERATOR BE ALLOWED NEAR THE KILN.

AT NO TIME SHOULD CHILDREN BE ALLOWED NEAR A KILN.

Let us finish with this thought!

There is no such thing as a foolish question. If you have any doubts about what to do, contact anyone in the L & L Manufacturing Company organization for an answer. We are all here to help you! Remember, we cannot help you unless you ask for help.

Good Luck . . . and many happy years of using your L & L Kiln.

TEMPERATURE EQUIVALENTS
ORTON STANDARD PYROMETRIC CONES

Cone Number	Small Junior Cones	Type of Ware
022	1112	
021	1137	
020	1175	
019	1261	Overglaze Colors,
018	1323	Enamels and Gold
017	1377	
016	1458	
015	1479	
014	1540	
013	1566	
012	1623	
011	1641	
010	1641	
09	1693	
08	1751	
07	1803	Low Fire Fritted Glazes
06	1830	Lead Glazes and
05	1915	Low Fire Earthenware
04	1940	
03	2014	
02	2048	
01	2079	
1	2109	
2	2124	Semi-Vitreous Ware
3	2134	
4	2167	
5	2185	
6	2232	
7	2264	China Bodies, Stoneware
8	2305	and Porcelain
9	2328	
10	2350	